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HOG FEEDING

Report of a Subcommittee of the Committee on Refuse Collection and Disposal of the Sanitary Engineering Division

SANITARY ENGINEERING DIVISION

{Discussion open until January 1, 1955}

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HOG FEEDING: REPORT OF A SUBCOMMITTEE OF THE COMMITTEE ON REFUSE COLLECTION AND DISPOSAL OF THE SANITARY ENGINEERING DIVISION

This report on Hog Feeding is one of a series produced by Subcommittees of the Sanitary Engineering Division's Committee on Refuse Collection and Disposal. Other subcommittees have reported on Collection; Dumping and Land Fill; Composting and Grinding; Incineration; Garbage Reduction; and State Activities and Fiscal Aspects. These reports are being published as separates as they are edited. While not consecutively issued or numbered, the reports will form a series representing the final report of the Committee on Refuse Collection and Disposal.

The committee consisted of:

Henry W. Taylor, Chairman	
Norman W. Nester	Charles L. Senn
Newell L. Nussbaumer	V. M. Ehlers
Sol Pincus	Charles L. McGauhey

Members of the Subcommittee concerned are listed at the end of this and the other Subcommittee reports.

FOREWORD

In 1901, M. N. Baker made the following and now classic statement: "In no branch of municipal service has so little progress been made in the United States as in the disposal of garbage. Why do such conditions exist? First, because the sanitary collection and disposal is appreciated neither by the general public nor the city officials; second, because it is seldom recognized that the problems incident to final disposal are largely engineering in character and therefore should be entrusted to engineers."

Mr. Baker's statement could be enlarged in scope by substituting "refuse" for "garbage" and adding emphasis to the need for engineering technique and administration in collection as well as in disposal methods.

Activities of this Committee on Refuse Collection and Disposal since its inception may be briefly summarized as follows:

In 1935 the Sanitary Engineering Division appointed a "Committee on Technical Aspects of Refuse Disposal" and this Committee functioned until January, 1942, during which period four reports were submitted and abstracted in Civil Engineering. The final report of this Committee stated that:

> "due to the unusual activity of members of the Committee and on account of the lack of general interest in the subject under consideration at this time, together with a feeling on the part of the

Committee Members that the subject is not particularly well adapted to Committee action, it is recommended that this Committee be discontinued."

The "unusual activity" of Members of the Committee still exists. Any lack of general interest in this subject has been replaced by the pressing necessity of solving a municipal problem which places increasing demands on public officials and engineers. A new Committee was appointed in 1947 and a progress report was submitted by the Chairman, Rolph Eliassen. This progress report outlined many of the facets of this subject and the need for application of engineering technique and administration.

At the 1949 meeting of this Society, a report was submitted by the Committee on "Advancement of Sanitary Engineering," which recommended the collaboration of the personnel from other technical organizations in the activities of Committees working on projects of broad scope. The recommendation met with quick approval and the present Committee has attempted to put these recommendations into tangible form by introducing Subcommittees who operate as task groups under the leadership of the personnel of the base Committee.

A report by the Committee in January 1950 confined itself to the organization of the Committee and Subcommittees with a prospectus of objectives. A Progress Report was submitted in October 1952 and included the efforts of seven Subcommittees.

This report for 1953 may be considered as the final report of the Committee with the objectives originally stated by this Committee. The increased activity in research, in design and operation are leading to an extensive program of literature emanating from individuals, colleges, institutions and commissions and any attempt by this Committee to include all this data would be futile and a subsequent report would be largely a bibliography of this literature. In other words, present activities have extended beyond the scope of the Committee and involve a volume of current literature from various sources which are available from their original source.

This report is actually individual reports of the seven task groups acting as Subcommittees. The Chairman has considered that each group contains acknowledged experts within the scope allotted to it and has not, in general, modified or condensed the reports as submitted by these separate Subcommittees. He has also considered that it would be impracticable for the base committee as a whole to attempt to pass on or modify the work of the individual groups since the scope of these groups includes such a varied field.

The Chairman has reduced the personnel of various Subcommittees, as stated in this report, to those who have been able to devote time and submit data to their various Subcommittee Chairman. The Chairman wishes to express his appreciation of the cooperation of the Committee and Subcommittee members.

HENRY W. TAYLOR, Chairman

ASCE Committee on
Refuse Collection and Disposal

Hog Feeding Garbage

The feeding of garbage to swine has been practiced on a large scale in the United States for many decades. At the turn of the century, for example, it was reported that "95 per cent of all the hogs in Massachusetts are fed on garbage, with generally satisfactory results". In 1902, one health commissioner reported that "feeding garbage to swine will not cause disease either in _____ or in other towns to which it is removed. In an experience of nineteen years, I have never found a case of sickness that could thus be explained". (1)

This trend has continued through the years. A 1948 Engineering News-Record survey of 300 cities showed that 41 per cent of the cities reporting utilized hogfeeding as a method of garbage disposal. Public Works Magazine, in a 1950 survey of 927 cities, listed 32 per cent of the reporting cities as using hogfeeding for garbage disposal. In 1951, a survey of refuse-collection and disposal practices in Iowa, conducted by the Institute of Public Affairs of the University of Iowa, (4) showed 23 of 76 reporting communities (or 30 per cent), disposing of their garbage by feeding it to swine. There were few reports of feeding farms which disinfected or "heat-treated" the garbage prior to feeding it to the swine.

Trichinosis - A Public Health Problem

In the course of his studies on trichinosis in the 1930's, the late Dr. Maurice Hall, of the National Institutes of Health, published findings of necropsies which indicated a significant infection of the American population with the parasitic worm, Trichinella spiralis. This work was continued by Dr. Willard Wright and his associates, and a completed report of these studies (published in 1943) indicated that 1 of every 6 Americans was infected at some time in his life with trichinae. (6) The findings of other research workers further substantiated the work done at N.I.H. (7) (8)

At the same time, the practice of feeding raw garbage to hogs was established as a primary link in the incidence of trichinae in swine, and subsequently in man through the ingestion of improperly cooked pork. (9) (12)

Certain health officials continue to recommend that municipal garbage disposal by hog feeding be discontinued. Their recommendation is based on the difficulty of maintaining hog farms so they do not produce neighborhood nuisances and become major vermin-breeding places.

Many health officials continue to point to the fact that hogs fed on garbage have 10 to 12 times as high a rate of trichina infection as those fed on cooked garbage or grain. Pasteurization temperatures destroy the trichinae, they say, and, therefore, all garbage should be heat treated before being fed to hogs.

In spite of that recommendation, the health officer of one large city answered an inquiry by stating that the state's proposal to require cooking of garbage intended for hog feeding would make operation of the large hog farm so costly as to cause its abandonment; that this would mean loss of revenue for the hog raisers, plus expenses for other disposal methods; that the high extra expense was not, in his opinion, justified on

public health grounds. He said a similar appropriation for tuberculosis control, for instance, would accomplish a greater public health protection than would the cooking of garbage.

State Control of Hog Feeding

Table I summarizes replies received from 44 states and 3 territories. Those marked * were based on a 1949 reply. Those not specially marked are based on a 1952 reply. States marked ** replied in both 1949 and 1952.

It is significant that only 3 states and 1 territory reported they required cooking of garbage as of early 1952. Two of those states reported no municipalities practiced hog feeding. This indicates that either the cooking of garbage is not economical or that law-makers are not convinced of the health import of trichinosis traceable to feeding raw garbage.

The questionnaires indicate as of 1952 that garbage from about 15,000,000 people was being disposed of by hog feeding, and 95 per cent of the garbage was fed without cooking.

Several state sanitary engineers report they are making or have recently made surveys of the refuse disposal methods used in their state. There are indications more will be considering adoption of specific regulations on hog farms. These may include requirements on method of construction and operation, liquid and solid waste disposal, rat and fly control, approval of plans, permissible locations, and other factors necessary to regulate this controversial but popular garbage disposal method.

Although trichinosis is reportable in 44 States, the disease is seldom diagnosed clinically, and infections other than those in epidemic form are usually unrecognized. The fact that an average of only 350 cases was reported annually to the Public Health Service for the period 1947-1952 supports this point. (See Table II entitled "Reported Cases of Trichinosis in the United States.")

It may be said that trichinosis has been considered, for many years, a public health problem in the United States. It is, apparently, more serious here than in any other country. Although there are practicable preventive measures, until recently relatively little has been accomplished in the application of these measures and in the breaking of the trichinosis cycle, with the exception of the establishment of Federal meat-inspection procedures to control the processing of pork to be eaten without cooking. (12)

Basic Sanitation

In addition to trichinosis, there has been another cause for public-health concern in the operation of garbage-feeding piggeries - namely, basic sanitation. Sanitary solid-waste disposal includes not only disinfection of the potential vector of disease, but also the handling of the media so as to minimize the breeding of insects and rodents and to prevent pollution of ground and surface water supplies. There is also, of course, the very important item of nuisances resulting from odors and

unsightliness. The latter has played a significant part in the location garbage-feeding hogfarms, as most local officials, who have had such problems to solve, well know.

V.E.—An Animal Health Problem

Until about the beginning of 1953, apparently, relatively little concern was given by hogfarmers to the need for basic preventive measures against certain swine diseases, such as cholera, in raw-garbage-fed hogs. Reliance was placed primarily on vaccination procedures, where possible, with a seeming acceptance of the relatively high morbidity and mortality rate among garbage-fed swine as a normal fact of life. However, as a result of a nationwide epidemic of a swine disease, vesicular exanthema ("VE"), new attention has been focused in this country on the dangers of feeding raw or untreated garbage to swine. Because of this epidemic, there is now strong support in the swine industry and among agricultural agencies for the elimination of the use of raw garbage for animal feed.

On June 16, 1952, VE was detected among swine at a hog-cholera-serum plant in the mid-west; within the next 11 months, infected swine had been found in 41 States throughout the Nation and in the District of Columbia. Epizootiological investigations, by the U. S. Department of Agriculture and the various State agencies concerned, indicated the possibility that garbage containing infected pork scraps had been fed raw to swine at a farm in another State, and that contaminated swine from this State had been shipped to other areas of the country before the disease was recognized. Most of the outbreaks in the other States were also identified with establishments where garbage was fed raw to swine, and the probable vehicle of infection was found to be contaminated pork scraps in garbage. As of May 18, 1953, VE had appeared among 468 garbage-fed herds, and in only 25 herds which had not been fed on garbage.

Of grave concern is the fact that symptoms of vesicular exanthema in swine are almost identical to those of foot-and-mouth disease. The control of foot-and-mouth disease depends so much on prompt diagnosis, slaughter of the infected herd with burial on the premises, and thorough disinfection of the entire area and plant, that any delay or error in diagnosis could well be disastrous to the livestock industry of the nation.

The U. S. Department of Agriculture reported as of May 9, 1953, that 155,754 swine had been disposed of by burial or special processing because of VE in 37 States and the District of Columbia. The cost to States and the Federal government, and losses to swine-raisers and allied industries, will amount to many millions of dollars when the final total is counted. To these must be added the costs of disinfecting plants, stockyards, and railway stock-cars; of supervising disinfection; inspection, and similar expenses. Difficult to enumerate, but certainly an important economic factor, are losses resulting from restraint of livestock movement, as a result of quarantine measures.

It has been said that "the best disease-control measure, as well as sanitation measure, would be the discontinuance of raising swine on garbage and the disposal of garbage in incinerators or sanitary

landfills". (12) Such a step would possibly curtail only 2 per cent of the hog population in this country, or about 1,500,000 swine. (12) If this goal could be reached, it would have an obvious impact, not only on that segment of the industry directly involved, but on the need for adoption of alternate methods by the hundreds of communities employing this method of garbage disposal. The obvious immediate solution appeared to be disinfection of all garbage before it is fed to swine.

Research

In view of the need for, and the lack of, published information on methodology of disinfecting garbage, the U. S. Department of Agriculture and the Department of Health, Education, and Welfare cooperated in preparing the publishing of a summary of all available material on the subject. (13) In addition, Iowa State College has received (May 1953) a PHS grant for the purpose of studying time-temperature relationships with respect to the survival of trichinae and other pathogenic organisms in garbage being heat-treated for swine feed. Also, the PHS Region II office has been conducting field investigations on the efficiency of cooking garbage in trucks; this is a cooperative project with the New Jersey State Health Department and swinefarmers in the Secaucus, New Jersey area. The PHS also collaborated in a short-term project to determine the effectiveness of the destruction of trichinae and other pathogenic organisms in a private garbage-dehydration operation serving a large city with the University of Nebraska Medical School and the Nebraska State Department of Health. It is hoped that the findings of the last two-mentioned projects will become available in the near future. It is anticipated that, with the above information available, and coupled with further field experience and equipment investigations by industry, badly needed technological information on heat-processing of garbage will be provided.

Publications

In the fall of 1952, the USDA and PHS cooperatively prepared and distributed a technical guide designed to assist State authorities faced with the need to draft legislation and/or regulations to cope with the emergency. This guide contained pertinent definitions, a suggested permit system (application, revocation, etc.) and outlined disinfection procedures for all garbage fed to swine, inspection and enforcement procedures, and penalties.

Disinfection procedures were based on studies conducted in the early forties by N.I.H., which indicated that "garbage should be boiled for 30 minutes prior to being fed to swine". (14) In most cases, the legislation also included a section on maintenance of sanitation on the farms.

"The Garbage Hog Feeding Business in California", a 17-page illustrated booklet from the University of California, states that one ton of garbage, with good management, produces 50 pounds of pork. The booklet gives the following figures:

A 100-sow unit would dispose of 3,500 tons of garbage a year or approximately 9.5 tons per day. This would require 2 acres of land. For

California conditions, a modern, efficient layout for 100 sows would cost $31,400 for land, buildings, and equipment, plus $21,770 for the hogs.

Public Health Benefits from V.E.

Prior to the outbreak of VE previously described, six States and the Territory of Hawaii had regulations requiring the heat-treatment of garbage fed to swine. Apparently, the regulations were actively and effectively enforced only in Hawaii. As of July, 1953, little more than one year subsequent to the detection of VE at the hog-cholera-serum plant, 40 states had legislation or regulations requiring the disinfection of garbage to be fed to swine and the control of garbage-feeding farms. (See Table III, "Status of State Legislation as of 7-13-53".) In all cases, authority for enforcement was delegated to the State Department of Agriculture. The Territory of Alaska also passed regulations requiring the disinfection of all garbage fed to swine, with authority for enforcement vested in the territorial health department.

The part of the Public Health Service in the regulation of garbage-feeding practices concerns, primarily, the interstate shipment of garbage. In 1941, an Interstate Quarantine Regulation (Section 72.23, 1947 revision) was issued, requiring that any garbage shipped or transported across State lines must be heated to 212°F. for 30 minutes before being fed to swine. Although complete elimination of interstate violation has not been achieved, considerable progress has been made in certain major metropolitan areas and in a number of border areas where interstate shipments of raw garbage have been practiced.

In developing control programs to carry out the intent of legislation or regulations, several State health departments (in cooperation with the State departments of agriculture) have surveyed garbage-disposal practices in their communities. A basic-data form was developed by the Public Health Service for use in such surveys, and has been used by the States to permit collection of comparable data, and to facilitate practicable planning of control efforts locally, as well as in the States and for the Nation as a whole.

On April 22, 1953, the Bureau of Animal Industry, U. S. Department of Agriculture, published in the Federal Register a proposed program concerning the interstate shipment of pork and pork products. (Revisions were published in the June 6 and June 25, 1953 issues of Federal Register.) In essence, these regulations, when adopted, will make possible rigid control of interstate shipment of pork and/or pork products from raw garbage-fed hogs.

For many years, common objections to the disinfection of all garbage fed to swine included: "The swine do not fare as well." "It's too expensive." and "The heat-treatment of garbage is impractical." Actually, relatively little was known about the economics, methodology, and practicability of feeding cooked garbage to swine on a country-wide basis. However, there were certain installations (Federal penitentiaries and the Kansas City Penal Farm, for example) which practiced heat-treatment with a positive approach, and their experience was most favorable. As more data from operational experience and research are collected each day, this favorable experience is being substantiated. According

to a recent BAI survey in 28 States, (See Table IV, "Survey of Garbage Feeding Establishments Heat-Treating Garbage Utilized for Swine Feed") installations of heat-treatment equipment had been made at 143 farms, with most of the installations satisfactory in capacity and practicability. In all cases, they utilized garbage from institutions, military posts, restaurants, and similar sources. A total of 67,673 swine was reported fed at these farms, with costs reported as varying considerably. The largest farm (6,000 swine) fed 24 tons of garbage daily on an initial equipment cost of $10,000 with cost of cooking at 44 cents a ton (labor and fuel). A small farm (7 swine) utilized home made equipment which cost $10.00; its cost of cooking was reported as $10.00 per ton.

The APWA and the American Municipal Association jointly published, in May 1953, a report of a survey on recent developments in "Swine Feeding Method of Garbage Disposal." (15) According to this survey, 17 municipalities of 170 reporting have abandoned the hogfeeding method of garbage disposal since 1950. Fifty-seven additional municipalities, or about 40 per cent, reported that they expected to change their present hogfeeding method of disposal because of new or pending legislation prohibiting the feeding of raw garbage to swine. This fact is of special interest to engineers, since many communities will need consultation in determining the feasibility of alternate methods of disposal. The report also included a discussion of the economics of feeding cooked garbage to swine, and an analysis of an example of the economics on a 1,000 hog ranch which led to the conclusion: "An example of the economics of feeding cooked garbage to swine based on information appearing in this report is included. . . . If future experience confirms the information on which the example is based—and hence results deduced—municipalities using this method of disposal should experience no increase in the cost of disposing of garbage as a result of the widespread adoption of laws prohibiting the feeding of raw garbage to swine."

The serious health, agricultural, and economic implications of community solid-waste problems are now receiving increasing recognition. The recent vesicular exanthema epidemic has underscored the epidemic possibilities of one improper method of garbage disposal. It is believed that the time has arrived for a vigorous nationwide program for proper treatment or disposal of garbage to control disease and improve sanitation.

SUMMARY AND CONCLUSIONS OF THE SUB-COMMITTEE ON HOG FEEDING

The feeding of animals, principally swine, on garbage has been carried on by American communities on a large scale for a century or more. The suitability of this method of disposing of a portion of the communities' solid wastes has long been challenged because of the local nuisances frequently prevailing in the collection and feeding of the garbage. For the last twenty-five years a more serious challenge has been raised when it was shown that hogs fed on uncooked garbage, had a many times higher infestation of trichina worms than hogs raised on grain and that this situation appeared to be the primary cause of the high incidence of trichinosis among humans in the U. S. Over the past two decades the efforts

of public health and agricultural agencies to have hog raisers cook the garbage prior to feeding it to the animals was generally unsuccessful although the cooking of the garbage feed was held to be a necessary means of holding down this source of human infection. From questionnaire surveys conducted by the committee in 1950 and 1952, it was shown that only three states and one territory had state legislation requiring cooking of garbage fed to hogs. A requirement for the cooking of garbage transported across state lines which was added to the U. S. Interstate Quarantine Regulations in 1941 was able to accomplish little in controlling the practice of feeding uncooked garbage brought across state lines. Although the committee's questionnaires showed that in 1952 the garbage of approximately 15 million persons was being fed to hogs practically all uncooked, the small number of reported trichinosis cases had been unable to arouse any concerted control efforts.

The finding of the new swine disease, visicular exanthema, in this country in mid-1952 and its rapid spread to epidemic proportions (prevalent in 41 states within the year) brought an immediate change in the attitude to garbage feeding to swine. It had been quickly determined that the spread of the disease "VE" among hogs was primarily due to the feeding of uncooked garbage. The U. S. Department of Agriculture by early 1953 had adopted restrictive regulations preventing interstate movement of hogs and pork from areas where uncontrolled garbage feeding of hogs prevailed.

Under the pressure of industry, agriculture and public health agencies for legislation, forty states had enacted state legislation or regulations to control the practice of feeding raw garbage to animals by July, 1953. In almost all instances enforcement was placed with the agriculture departments.

As shown in recent surveys, a score of cities have discontinued sending garbage for hog feeding and many more cities are making preparations for changing to other methods of garbage disposal.

Although in some areas, where hog feeding with raw garbage had been common, there is resistance to the pre-cooking of garbage, it can be fairly safely predicted that the method of garbage disposal by feeding uncooked garbage to animals will be rapidly discontinued and such practices will no longer be favored or ignored by public agencies. This does not, however, mean that all garbage feeding of animals will or should be discontinued. The feeding of disinfected garbage, heat treated by cooking or drying,—may find an acceptable place in municipal waste disposal practice, if conditions for satisfactory collection, disinfection and animal raising are locally at hand. A review of recent surveys and reports of specific situations, indicate that there are a number of cities where separate collection of garbage and profitable arrangements for raising animals on garbage can be found.

It has been reported that one ton of garbage can produce 50 pounds of pork which may mean a value of 10 dollars to the hog farmer. There is some difference of opinion among hog farmers as to whether cooking of garbage will give improved hog feeding and growth. There are hog farmers now feeding garbage who hold that with some selection and adjustments the cooked garbage will be used to greater extent by the hogs than uncooked garbage, and a reduction in hog losses will also result. The

municipalities sending garbage to hog farmers in many cases obtain an appreciable revenue from the sale of the garbage and at the same time find a saving in the final disposal of their solid wastes, reduced by 5% to 10% in volume.

The primary factor requiring development will be the proper disinfection of the garbage and maintenance of improved sanitary conditions. Studies for the proper disinfection of garbage, including efficient cooking and handling equipment have been initiated or supported by Federal funds during the past two years. These studies should not be permitted to lag or be held up.

As a general conclusion concerning animal feeding as a method of garbage disposal, the committee holds that the feeding of undisinfected garbage to animals should be eliminated by State and local legislation and Federal control measures, and that cooperative studies be pursued energetically to develop satisfactory methods for disinfection of garbage and proper sanitation for animal feeding so that where local conditions may be suitable this method of garbage disposal with its advantages of recovery of a valuable waste product and of significant economies may be available to communities.

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Respectfully Submitted:

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Subcommittee of the Committee on Refuse Collection and Disposal on Hog Feeding

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Table I

STATE CONTROL OF HOG FEEDING

State or Territory	State Health or Sanitation Regulations on Hog Feeding	Must Garbage Be Cooked?	Number of Communities Feeding Most Garb. to Hogs	% Urban Pop Using Hog Feeding Disposal	Total Pop Using Hog Feeding Disposal
Alabama*			0	0	0
Arkansas**	no	no	50	12%	50,000
California	no	no	140		6,590,000
Colorado**	no	no	164		707,000
Connecticut*	no	no	19	50%	
Delaware*	no	no	0		
Dist. Columbia	no		0		
Florida*	yes	?	4	2%	
Georgia*	no		0		0
Idaho*	no		0		0
Illinois	no	no	36		
Indiana*	yes	no			
Iowa*	no	no	24	56%	
Kansas**	no	no	84		500,000
Kentucky*	yes	yes	0		0
Louisiana**	yes	yes	0		0
Maine**	no	no	16		235,000
Maryland*	no	no	0		0
Massachusetts*	no	no	114	78%	
Michigan*	no	no	0		0
Minnesota*	no	no	16	51%	
Mississippi**	no	no	0		0
Missouri*	no	no	49	90%	
Montana	no	no			
Nebraska**	no	no	5		275,000
Nevada	no	no	1		3,000
New Hampshire**	no	no	26		80,000

(continued next page)

Table I (Cont)

STATE CONTROL OF HOG FEEDING

State or Territory	State Health or Sanitation Regulations on Hog Feeding	Must Garbage Be Cooked?	Number of Communities Feeding Most Garb. to Hogs	% Urban Pop. Using Hog Feeding Disposal	Total Pop. Using Hog Feeding Disposal
New Jersey*	yes	no			
New Mexico	no	no	3		23,000
New York**	yes	yes	18	10% Exc.NYC	
North Carolina*	no	no	0		0
North Dakota**	no	no	1		40,000
Oklahoma**	no	no	0		0
Oregon*	yes	?	1	1%	
Pennsylvania*			0		0
Rhode Island	no	no	14	48%	
South Carolina*	no	no	0		0
South Dakota**	no	no	8		?
Tennessee*	no	no	0		0
Texas	no	no	16		2,000,000
Utah**	no	no	2	56%	
Virginia*	no	no	0		0
Washington**	no	no	29	51%	
West Virginia	no	no	0		0
Wyoming**	no	no	0		0
Alaska*	no	no	0		0
Hawaii*	yes	yes	8	100%	

Table II

REPORTED CASES OF TRICHINOSIS IN THE UNITED STATES

State	1947	1948	1949	1950	1951	1952
Alabama	*	*	*	*	*	*
Arizona	0	0	0	0	0	0
Arkansas	1	5	0	0	0	2
California	32	39	24	21	40	32
Colorado	0	0	1	1	0	2
Connecticut	20	25	13	15	31	9
Delaware	0	0	0	0	0	0
District of Columbia	0	0	2	2	0	0
Florida	*	*	*	*	1	0
Georgia	0	1	0	0	0	4
Idaho	3	0	0	6	0	0
Illinois	5	11	5	2	4	4
Indiana	3	2	3	2	5	3
Iowa	0	10	37	0	1	19
Kansas	0	0	1	0	0	0
Kentucky	0	0	0	0	0	0
Louisiana	0	0	0	2	1	1
Maine	1	7	2	13	1	4
Maryland	2	3	5	3	6	3
Massachusetts	59	42	32	32	24	24
Michigan	7	8	9	11	7	2
Minnesota	36	14	0	6	1	3
Mississippi	*	*	*	*	*	*
Missouri	0	0	0	0	0	2
Montana	0	4	0	0	0	0
Nebraska	1	1	1	1	0	1
Nevada	5	0	3	3	0	0
New Hampshire	0	0	0	0	0	0
New Jersey	29	28	24	26	46	19
New Mexico	0	0	0	0	0	0
New York	204	233	141	135	190	167
North Carolina	*	*	*	*	0	1
North Dakota	0	0	0	0	0	0
Ohio	13	18	24	19	10	22
Oklahoma	0	0	1	0	0	2
Oregon	13	0	0	2	1	0
Pennsylvania	6	26	21	12	14	19
Rhode Island	4	8	2	4	4	6
South Carolina	2	0	0	0	0	0
South Dakota	0	0	0	0	0	0
Tennessee	3	1	0	1	1	2
Texas	*	*	*	*	*	*
Utah	0	0	1	0	0	0
Vermont	0	0	0	0	0	0
Virginia	*	*	*	*	0	1
Washington	1	2	0	16	5	0
West Virginia	1	0	0	0	0	1
Wisconsin	0	0	0	0	0	1
Wyoming	0	0	0	0	0	0
TOTAL	451	487	353	327	393	356

*Disease stated not notifiable

**Provisional

Table III

STATUS OF STATE LEGISLATION
FOR CONTROLLING THE FEEDING OF GARBAGE TO SWINE
JULY 1953

States with legislation	States with regulations	States considering legislation	Legislation defeated	No action
1. Alabama	1. Colorado*	1. Arkansas	1. California	1. Vermont
2. Arizona	2. Kentucky	2. South Carolina**	2. New Jersey	
3. Connecticut	3. Maryland		3. New Mexico	
4. Delaware			4. North Dakota	
5. Florida			5. Rhode Island	
6. Georgia				
7. Idaho			Nevada*	
8. Illinois			Colorado*	
9. Indiana				
10. Iowa				
11. Kansas				
12. Louisiana				
13. Maine				
14. Massachusetts				
15. Michigan				
16. Minnesota				
17. Missouri				
18. Montana				
19. Nebraska				
20. New Hampshire				
21. New York				
22. North Carolina				
23. Ohio				
24. Oklahoma				
25. Oregon				
26. Pennsylvania				
27. South Dakota				
28. Tennessee				
29. Texas				
30. Utah				
31. Washington				
32. West Virginia				
33. Wisconsin				
34. Wyoming				

*Defeated law but passed regulations
**Awaiting Governor's signature

Table IV

Survey of Garbage-Feeding Establishments Heat-Treating Garbage Utilized for Swine Feed as of 5-15-53

Data Courtesy of Bureau of Animal Industry, U. S. Department of Agriculture

State	No. of Installations	No. of Swine Fed	Amount Garbage Fed (tons)	Heat-Treatment Satisfactory	Avg. Cost/ton (dollars)
Alabama	3	956	3[a]	3	3.00[a]
Arizona	-	-	-	-	-
Arkansas	1	185	a	1	a
California	-	-	-	-	-
Colorado	6	7,660	78.5	6	0.86[a]
Connecticut	1	800	5 (est)	1	4.50
Delaware	-	-	-	-	-
Dist. of Columbia	-	-	-	-	-
Florida	17	3,379	26.7[b]	17	5.60[c]
Georgia	7	3,534	3[d]	5	1.57[e]
Idaho	f	-	-	-	-
Illinois	11	10,125	111	11	0.72[b]
Indiana	g	-	-	-	-
Iowa	-	-	-	-	-
Kansas	-	-	-	-	-
Kentucky	-	-	-	-	-
Louisiana	14	5,310	26.2	13[a]	4.93[e]
Maine	-	-	-	-	-
Maryland	11	3,547	57	10[a]	2.52
Massachusetts	6	825	8	5[a]	5.26
Michigan	-	-	-	-	-
Minnesota	2	95	1	2	a
Mississippi	3	1,324	17.3	3	0.80[a]
Missouri	1	2,160	9	1	a
Montana	4	1,000	5.3	3[a]	3.00[e]
Nebraska	15	1,316	13	14	1.58
Nevada	-	-	-	-	-
New Hampshire	-	-	-	-	-
New Jersey	3	3,010	69	3	1.06
New Mexico	-	-	-	-	-
New York	-	-	-	-	-
North Carolina	-	-	-	-	-
North Dakota	1	150	0.5	1	a
Ohio	-	-	-	-	-
Oklahoma	1	2,000	10	1	0.30
Oregon	6	2,770	11	6	7.70[a]
Pennslyvania	-	-	-	-	-

Table IV (cont'd)

Survey of Garbage-Feeding Establishments Heat-Treating Garbage Utilized for Swine Feed as of 5-15-53

Data Courtesy of Bureau of Animal Industry, U. S. Department of Agriculture

State	No. of Installations	No. of Swine Fed	Amount Garbage Fed (tons)	Heat-Treatment Satisfactory	Avg. Cost/ton (dollars)
Rhode Island	-	-	-	-	-
South Carolina	-	-	-	-	-
South Dakota	k	-	-	-	-
Tennessee	3	2,632	a	3	a
Texas	1	125	a	1	a
Utah	-	-	-	-	-
Vermont	-	-	-	-	-
Virginia	10	5,450	59[a]	10	2.06
Washington	5	6,840	32	5	2.33
West Virginia	2	202	0.7	2	a
Wisconsin	2	495	4	2	1.25
Wyoming	7	1,183	10.5	7	8.70[a]
TOTALS	143	67,673	560.7	136	

(14 not reported)

- \- No report.
- a- No or inadequate data on installation
- b- No data on 7 installations
- c- No data on 4 installations
- d- No data on 2 installations
- e- No data on 3 installations
- f- No feeders using cooked garbage in State.
- g- 64 of 256 known garbage-feeders cooking or to begin 5/21/53.
- h- 1 unsatisfactory.
- k- Very few in State; all plan to quit when law goes into effect.

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